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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/925,124	08/08/2001	David M. Heffelfinger	BIM-047	5878

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EXAMINER	
WORKU, NEGUSSIE	
ART UNIT	**PAPER NUMBER**
2626	

DATE MAILED: 05/20/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/925,124	HEFFELFINGER ET AL.	
	Examiner	Art Unit	
	Negussie Worku	2626	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *08 August 2001*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-27* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,3-6, 11-12 ad 15-27* is/are rejected.

7)☒ Claim(s) *2,7-10,13 and 14* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *08 August 2001* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *01/08/2002*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☒ Other: Detailed Action

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 1, 3-6, 11-12 and 15-27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mathies et al. (USP 4,979,824) in view of Macken (USP 6078420).

With regard to claim 1, Methies et al. an optical scanner (fig 9) for scanning a fluorescent sample (a beam directed to substrate 67 of fig 9) associated with a sample container, (sample substrate 50 of fig 9) said scanner (scanning optics 71 of fig 9) comprising: at least one laser producing an illumination beam (laser or light source 68 of fig 9, generate an illumination beam); an illumination focus lens, (lens 69 of fig 9) focusing said illumination (beam or light of fig 9) into a beam spot said beam spot targeted on the fluorescent sample (sample substrate 67 of fig 9); a reflective light collector (lens 72 of fig 9) positioned proximate to said sample container (sample substrate 50 of fig 9) and in a path of said illumination beam (illumination beam generated by a light source of fig 9) that collects light from a collector focus (lens 72 of fig 9) and reflects collected light as a collimated emission beam, see (col.6, lines 60-65);

and light detection optics, (detectors 76 of fig 9) said light detection optics detecting the intensity of said emission beam, see (col.6, line 65 through col.7, lines 1-5).

Mathies et al. does not disclose wherein said light is reflected at an angle in relation to an optical axis of said illumination beam; said light collector having a hole that allows said illumination beam to pass through said reflective light collector; and light detection optics, said light detection optics detecting the intensity of said emission beam.

In the same area of laser scanning system Macken discloses wherein said light is reflected at an angle in relation to an optical axis of said illumination beam, (light beam 21 of fig 2, can be reflected at an angle in relation to the optical axis 25 when mirror 25A moves in relation to axis 25a, see col.4, lines 15-20); said light collector (mirror 15 of fig 2, as a light collector) having a hole that allows said illumination beam to pass through said reflective light collector (a light collector 15 of fig 2, having a hole 12 that allow illumination beam to pass through, as shown in fig 2, and discussed in col.3, lines 45-50).

Therefore, it would have been obvious to a person with ordinary skill in the art at the time the invention was made to have modified the laser scanning and illumination apparatuses to include: light is reflected at an angle in relation to an optical axis of said illumination beam; said light collector having a hole that allows said illumination beam to pass through said reflective light collector; and light detection optics, said light detection optics detecting the intensity of said emission beam.

It would have been obvious to a person with ordinary skill in the art at the time the invention was made to have modified the image reading and illumination device of Mathies et al. by the teaching of Macken because of the following reason: it would have provided an improved all-reflective high power laser beam scanning system wit an improved adjustable focal length which at least a scanning mirror to angularly steer to a predetermined position.

With respect to claim 3, Mathies et al. disclose the optical scanner wherein said illumination focus lens (lens 69 of fig 9) is an expander/contractor lens allowing shaping of the illumination beam spot size (beam spot size substrate 67 of fig 9).

With respect to claim 4, Mathies et al. disclose the optical scanner (fig 9) wherein said illumination focus lens (lens 72 of fig 9) is achromatic.

With respect to claim 5, Mathies et al. disclose the optical scanner (fig 1), wherein said reflective light collector is paraboloid mirror (mirror 71 of fig 9, is an equivalent of parabolic mirror).

With respect to claim 6, Mathies et al. does not disclose the optical scanner wherein said parabolic mirror has a hole through which the illumination beam may pass.

In the same area of laser scanning Macken disclose the optical scanner wherein said parabolic mirror (15 of fig 2) has a hole (hole 12 of fig 2) through which the illumination beam (beam 21 of fig 1) may pass.

Therefore, it would have been obvious to a person with ordinary skill in the art at the time the invention was made to have modified the laser scanning and illumination apparatuses to include: parabolic mirror has a hole through which the illumination beam may pass.

It would have been obvious to a person with ordinary skill in the art at the time the invention was made to have modified the image reading and illumination device of Mathies et al. by the teaching of Macken because of the following reason: it would have provided an improved all-reflective high power laser beam scanning system with an improved adjustable focal length which at least a scanning mirror to angularly steer to a predetermined position.

With respect to claim 11, Mathies et al. disclose the optical scanner (fig 1), wherein said spatial filter (spatial filter 73 of fig 9) includes an aperture.

With respect to claim 12, Mathies et al. disclose the optical scanner (fig 1), further comprising an electronic memory for storing detection intensity measurements, (computer 36 for storing data, such as the a mount of light emitted from the light source)

With respect to claim 15, Mathies et al. disclose the optical scanner (fig 1), wherein the

depth of detection is limited to a depth of field between 1 and 500 nm.

With respect to claim 16, Mathies et al. disclose the optical scanner (fig 1), wherein the reflective light collector (72 of fig 9) has a focus point within said beam spot (film spot 66 of fig 9).

With respect to claim 17, Mathies et al. disclose the optical scanner (fig 1), further comprising a beam splitter (71 of fig 9) placed in the path of the illumination beam (beam from light source 68 of fig 9) and diverting a portion of the illumination beam and a power monitor positioned in the path of the diverted illumination beam (detector 76 is positioned as a power monitor in a direction beam is directed, see (fig 1).

With respect to claim 18, Mathies et al. disclose the optical scanner (fig 1), wherein at least one laser (laser shown in fig 9) comprises a first and a second laser and a reflective beam combining optic, (lens 72 combine the two laser directed from mirror 71 of fig 9) said beam combining optic merging laser beams from said first and second laser into a single illumination beam (fig 9).

With respect to claim 19, Mathies et al. disclose the optical scanner (fig 1), further comprising a first and a second shutter (73 of fig 9) placed in front of each laser beam from said first and second laser (fig 9).

With respect to claim 20, Mathies et al. disclose a method to optically interrogate a sample having discrete, (substrate 67 of fig 9) optically detectable targets the method comprising: directing a focused laser light beam onto said sample (laser beam from light source 68 focused by lens 69 to the sample substrate 67 of fig 9); moving said focused laser light in relation to said sample such that a waist of said focused laser light moves through an area of said sample (a focused laser light is moving across the substrate 67 as shown in fig 10); collecting fluorescent emission with a reflective light collector, (collector 72 of fig 9) said light collector having a focal depth, said light collector collimating said collected light into a collimated emission beam (laser beam form light source 68 of fig 9); which is directed to an angle relative to the emission beam to detection optics (beam from light source 68 of fig 9, is perpendicularly directed to the substrate as shown in fig 9); and measuring an intensity of the collected emission light (detector 76 detects the amount of light emitted from the light source to the sample substrate).

With respect to claim 21, Mathies et al. disclose the method (fig 9), further including focusing said collimated emission beam through a spatial filter (73 of fig 9) having an aperture through which a percentage of impinging light may pass, said spatial filter limiting the depth of field to a selected depth, see (col.6, lines 40-45).

With respect to claim 22, Mathies et al. disclose the method (fig 9), wherein said sample is a homogenous assay mixture.

With respect to claim 23, Mathies et al. disclose the method (fig 9), further comprising prior to moving said focused laser light, focusing a beam waist of said focused laser light onto a defined layer in said sample (substrate 67 of fig 9).

With respect to claim 24, Mathies et al. disclose the method (fig 9), wherein collecting light with a reflective light collector (reflective light collector 72 of fig 9) includes collecting light with a parabolic mirror (mirror 71 is equivalent of parabolic mirror).

With respect to claim 25, Mathies et al. disclose the method (fig 9), further comprising analyzing the intensity of collected emission light (light beam directed from light source 68 of fig 9) to identify discrete optically detectable targets (on a substrate target 67 of fig 9).

With respect to claim 26, Mathies et al. disclose the method (fig 9), wherein focusing said collected light through an optical device (fig 1) having an aperture includes focusing said collected light into an optical fiber (optical fiber is inherently provided).

With respect to claim 27, Mathies et al. disclose the method (fig 9), wherein focusing said collected light through an optical device (fig 9) having an aperture includes focusing said collected light through a pinhole aperture in a spatial filter (73 of fig 9).

Claims objected to having allowable subject matter

3. Claims 2, 7-10 and 13-14 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

With respect to claim 2, 7-10 the prior art searched and of record neither anticipates nor suggests a beam scanner that moves the beam spot in a scan through a layer in said container; a spatial filter placed in the emission beam said spatial filter transmitting a portion of said focused emission light; a detection lens positioned in the path of the collimated emission beam between said light collector and said spatial filter, wherein the detection lens focuses collimated light through the spatial filter.

With respect to claim 13 and 14, the prior art searched and of record neither anticipates nor suggests wherein said light detection optics includes a beam splitter and at least two light detectors, wherein the beam splitter directs the emission wavelengths above a threshold wavelength to a first light intensity detector and wavelengths below a threshold wavelength to a second light intensity detector.

4. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Negussie Worku whose telephone number is 571-272-7472. The examiner can normally be reached on 9am-6pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kimberly Williams can be reached on 571-272-7471. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Negussie Worku
05/12/05

KIMBERLY WILLIAMS
SUPERVISORY PATENT EXAMINER